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Inland Waters Directorate
Western and Northern Region

Direction générale des eaux intérieures
Région de l'ouest et du nord

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WESTERN AND NORTHERN REGION
INLAND WATERS DIRECTORATE
CONSERVATION AND PROTECTION
ENVIRONMENT CANADA

Report to

The 1989 Athabasca-Mackenzie Waterways Workshop

on

The 1988 Mackenzie River Water Level Monitoring and Forecasting

Prepared by

Chris Heron
Data Control Supervisor

and

Paul Squires
Data Control Technician

Water Resources Branch
NWT Programs
Yellowknife, NWT

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Preface

Environment Canada through it's Water Survey of Canada offices operated a water level monitoring and forecasting program along the Mackenzie River Navigational System in 1988. This program was for navigational purposes only. It provides a three day water level forecast at key navigational points along the system. This program was conducted out of the Water Survey of Canada office in Yellowknife. The program is jointly funded by Environment Canada and the Ministry of Transport.

Introduction

The Mackenzie River has historically served as a major transportation route.

With increased navigational traffic due to oil and gas exploration in the Beaufort Sea an agreement was made between Transport Canada and Environment Canada in 1965 to provide water level monitoring and forecasting along the major Mackenzie River route. This forecasting program has developed into an important feature of the navigation and supply industry.

Pre-Season Plans and Attendant Results

The annual pre-season workshop, hosted by the Canadian Coast Guard at Hay River was held on May 17, 1988. Topics of discussion and subsequent conclusions were:

1. The water supply outlook for 1988 was expected to be either average or slightly above average. The Slave and Peace River systems are expected to be average and Great Slave Lake is above the historical average by approximately 0.01 m (January to June 1988).

    a) Great Slave Lake water levels for the forecast season remained at historical average levels.

    b) Mackenzie River system throughout the forecast season was expected to remain at average to slightly above average levels.

2. The data collection network that was in place for the 1987 season will remain the same for 1988.

3. The real-time forecast network for 1988 was established as follows:

Great Slave Lake at Yellowknife Bay	Water Survey of Canada
Mackenzie River near Fort Providence	Data Collection Platform
Mackenzie River at Fort Simpson	Telemark
Liard River at Fort Liard	Paid Observer/Telemark
South Nahanni R. above Virginia Falls	Data Collection Platform
Root River near the Mouth	Data Collection Platform
Mackenzie River near Wrigley	Data Collection Platform
Mackenzie River at Norman Wells	Data Collection Platform
Mackenzie River at Sans Sault Rapids	Data Collection Platform
Mackenzie River at Fort Good Hope	Paid Observer
Redstone River 63 km above the Mouth	Data Collection Platform
Carcajou River below Imperial River	Data Collection Platform
Mountain River below Cambrian Creek	Data Collection Platform

4. Tentative data for Great Slave Lake at Yellowknife Bay is to supplied to Canadian Coast Guard, Hay River, on a bi-monthly basis during the navigation season.

Water Level Forecasts 1988

The forecast program commenced June 1, 1988, with telexs being issued daily except weekends. The forecast concluded October 17, 1988, at the request of the Canadian Coast Guard. Out of a possible 95 forecast telexes, 90 were issued to the users. The users were as follows:

Air Radio	Hay River
Air Radio	Fort Simpson
Air Radio	Norman Wells
Arctic Transport	Calgary
~~Arctic Transport~~	~~Tuktoyaktuk~~
Canadian Coast Guard	Hay River
Canadian Coast Guard	Inuvik
Cooper's Barging	Fort Nelson
Imperial Oil Ltd.	Norman Wells
Northern Transportation Co. Ltd.	Hay River (forwarded to Edmonton)
Public Works Canada	Edmonton

Water level information was issued from May 9 to May 29, 1988, with the forecast commencing June 1, 1988. Problems with the telex in Yellowknife resulted in 5 days of forecast being missed. Two rainstorm events during the season caused some confusion.

Program for 1989

The program should appear unchanged to the user. Due to anticipated equipment installation at the Inland Waters Directorate regional office in Yellowknife, the acquistion and processing of the forecast will hopefully be improved for the up-coming year. At the present time there are no stations being monitored on the eastern side of the Mackenzie River.

Appendices

1. Program Costs

2. Recorded and forecast stage hydrographs for all gauging stations used in the forecast.

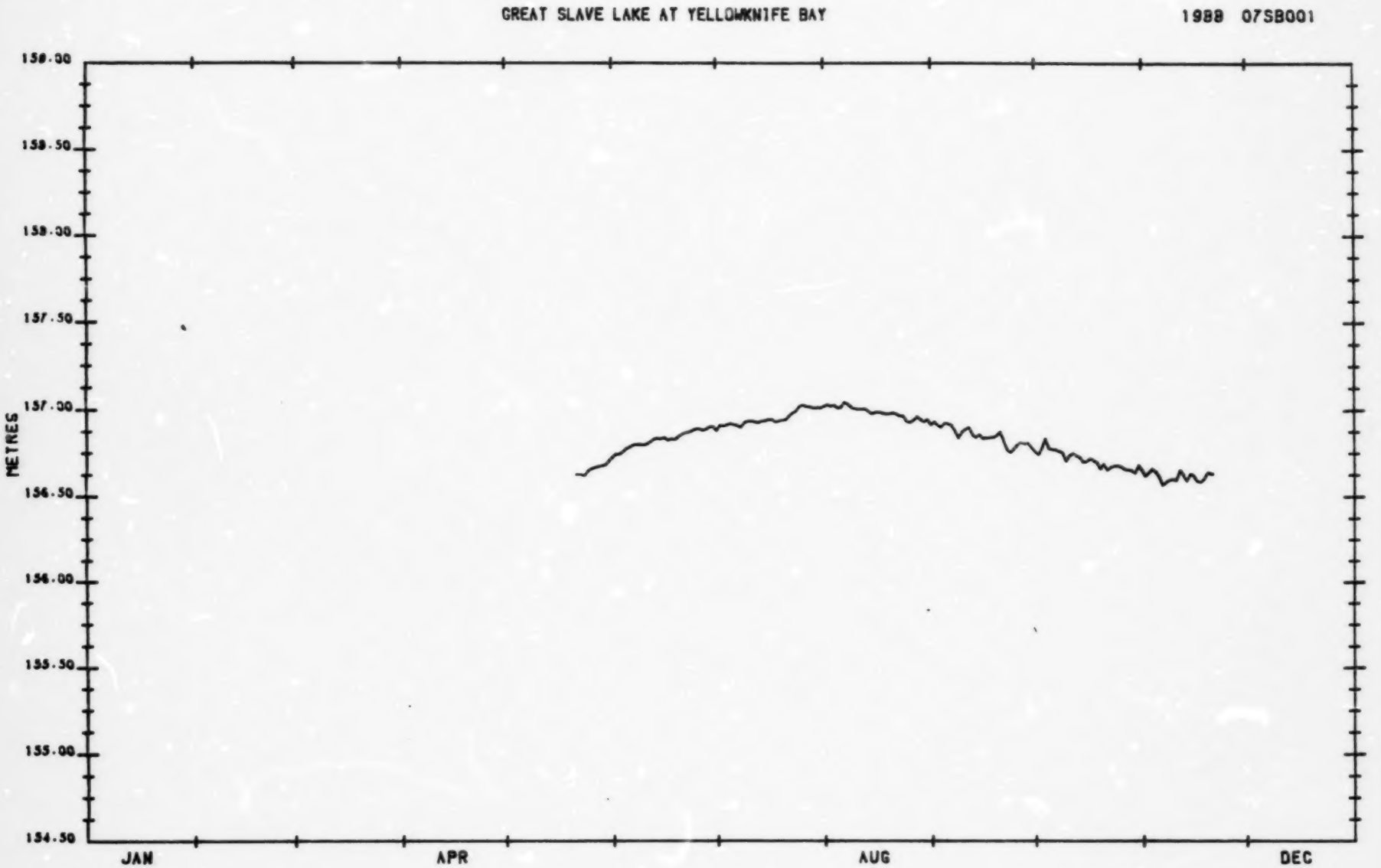
   Note: The forecast data is plotted in red for the following stations; Mackenzie River at Norman Wells, San Sault Rapids and Fort Good Hope.

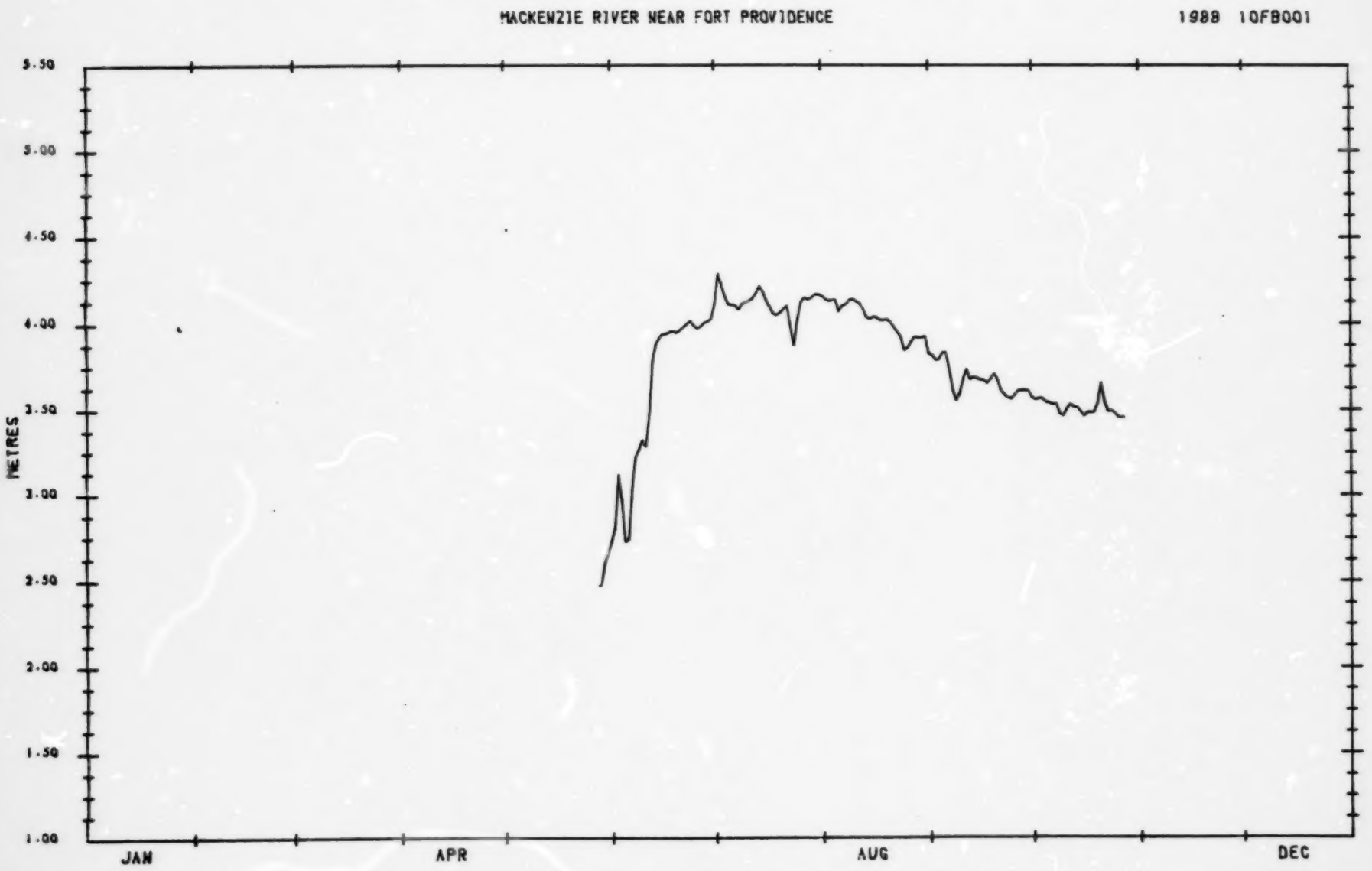
Mackenzie River Water Level Forecasts

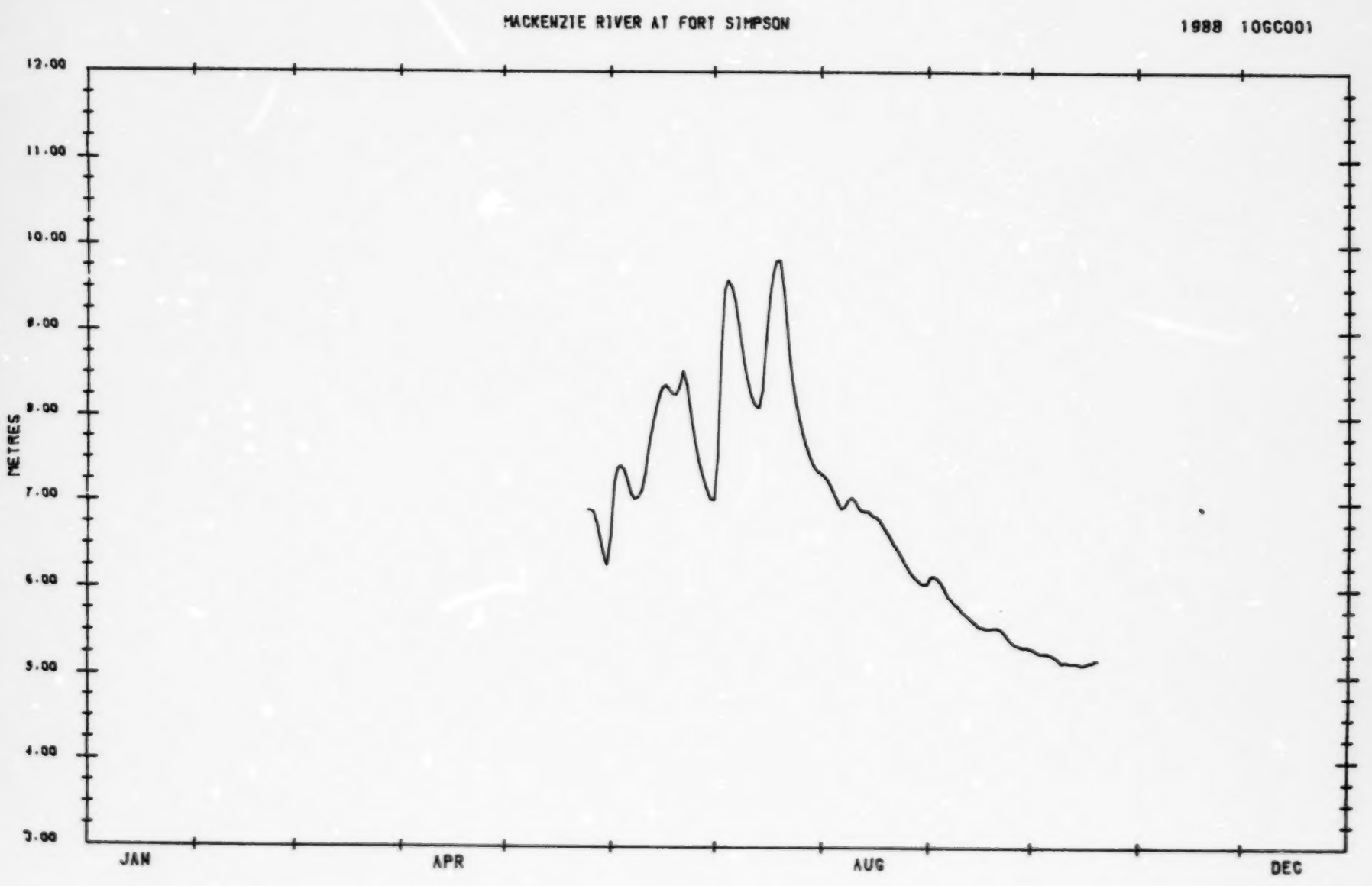
Operational Costs - 1988

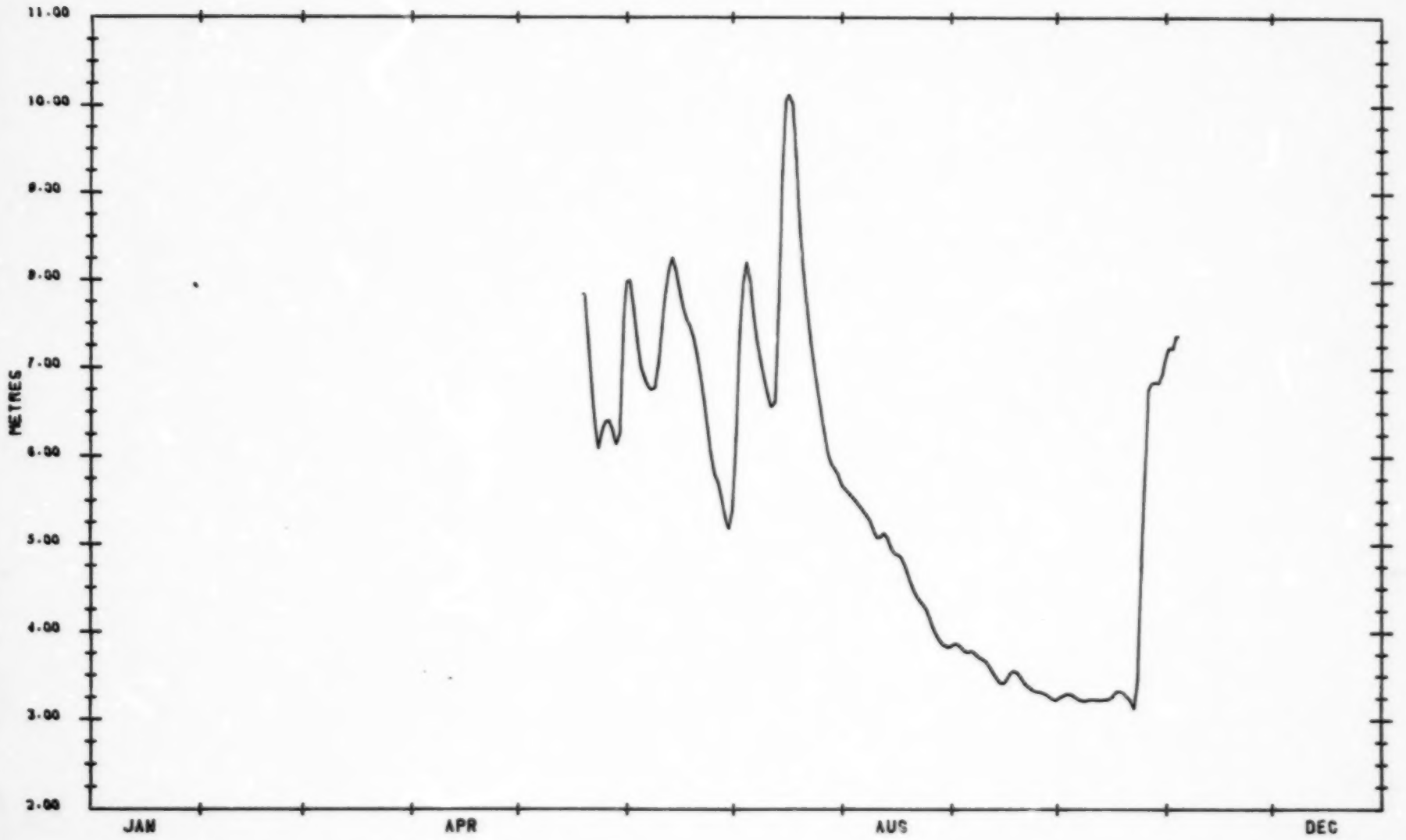
Table Number 1

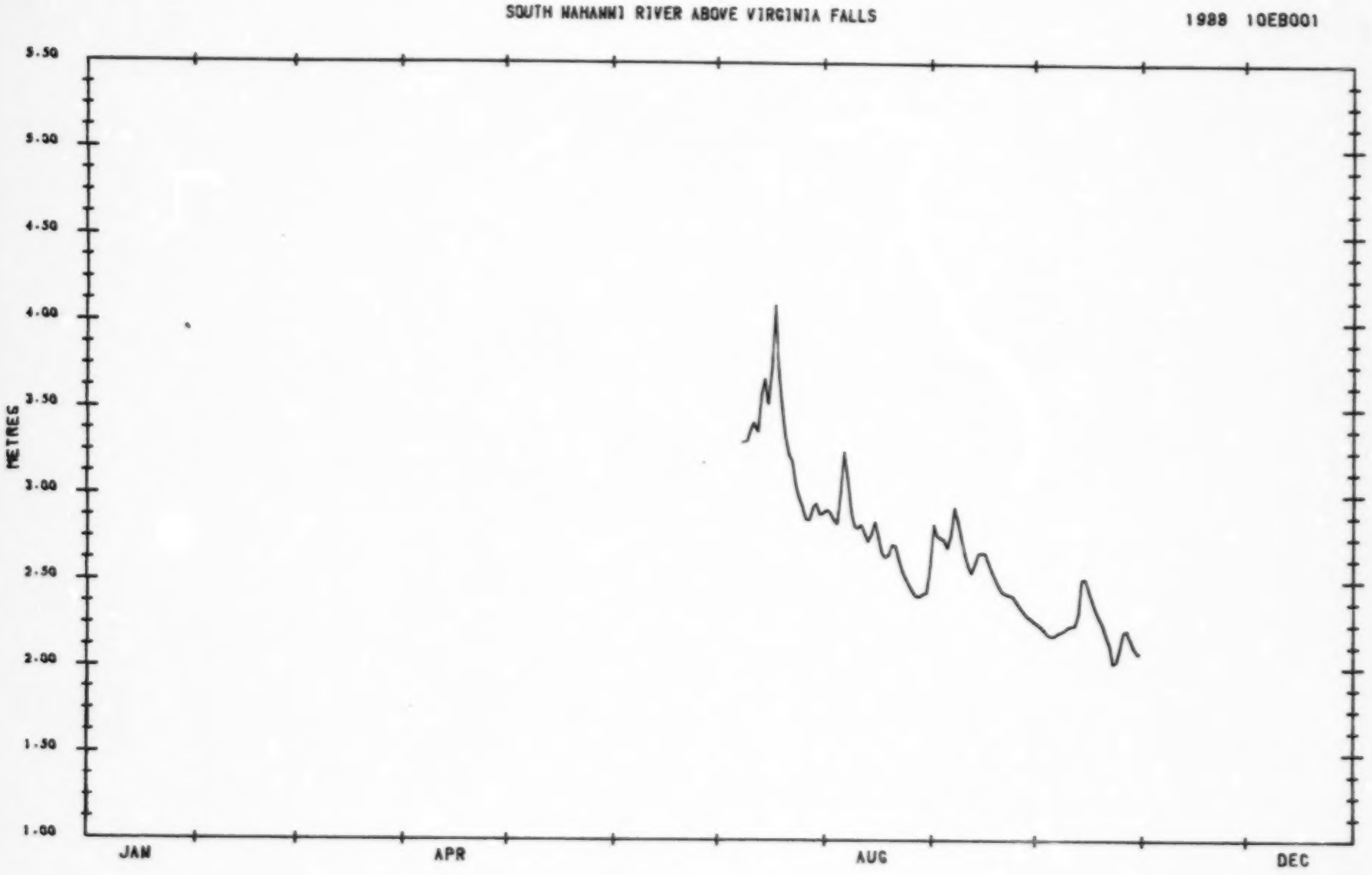
Item	Cost	Cost Shareable DOE	MOT
Pre-season Workshop	402.00		
Athabasca-Mackenzie Waterways Workshop - Vancouver	1284.00		
Observer Service June to October	4425.00		
Travel & Expenses Fort Smith Inuvik/Norman Wells	18840.00		
Maintenance - Station Equipment	1021.00		
Communications Interrogating DCP's Telex - Messages to Users Telephone - Observers	3096.00		
Forecast Report Printing and Distribution	132.00		
Total Operational Costs Total Salaries	29200.00 13927.46	14600.00 13927.46	14600.00
GRAND TOTAL	**43127.00**	**28527.00**	**14600.00**

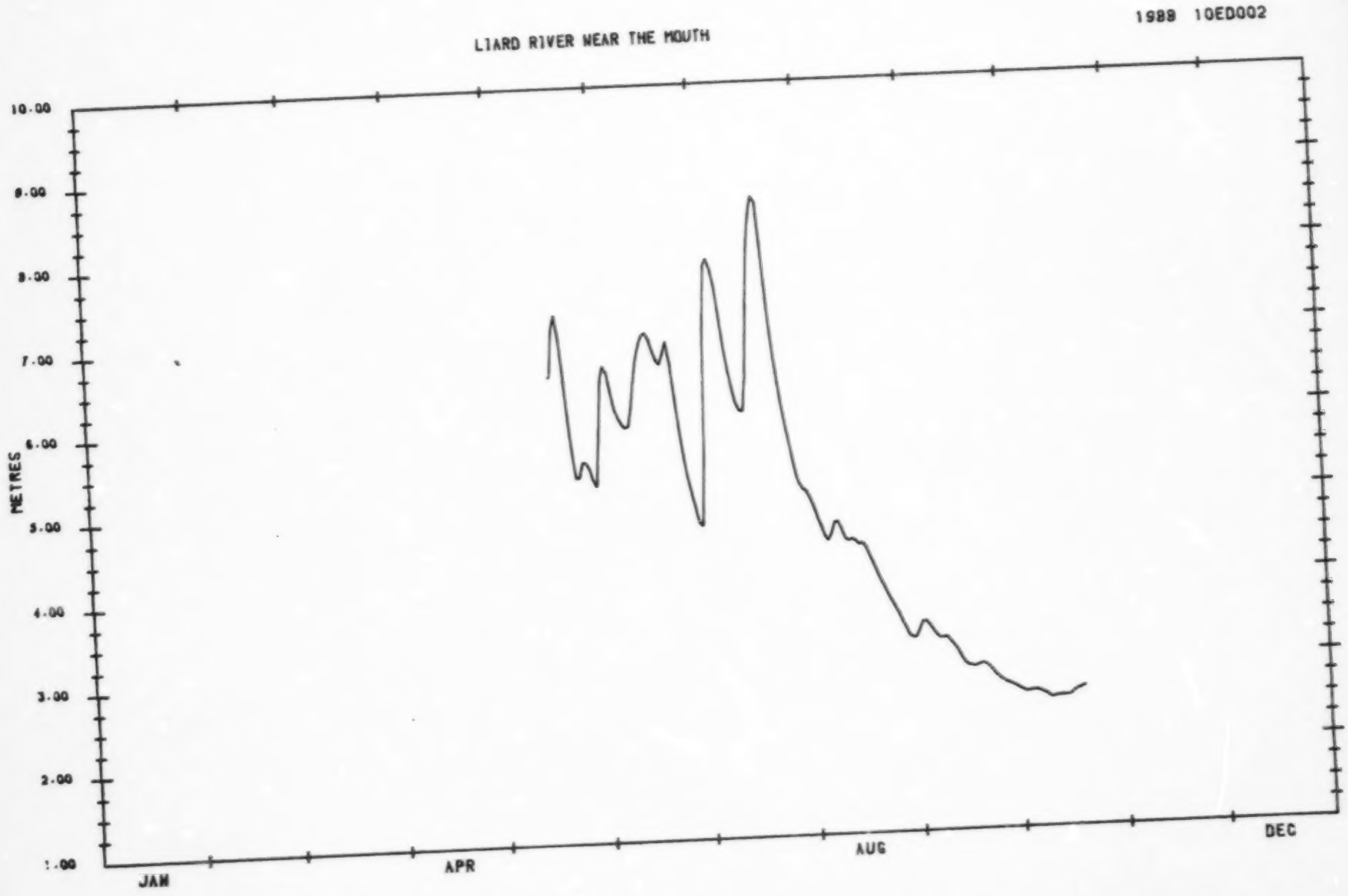

GREAT SLAVE LAKE AT YELLOWKNIFE BAY
1988 07SB001
160.00
159.50
159.00
158.50
158.00
157.50
157.00
156.50
156.00
155.50
155.00
154.50
METRES
JAN
APR
AUG
DEC

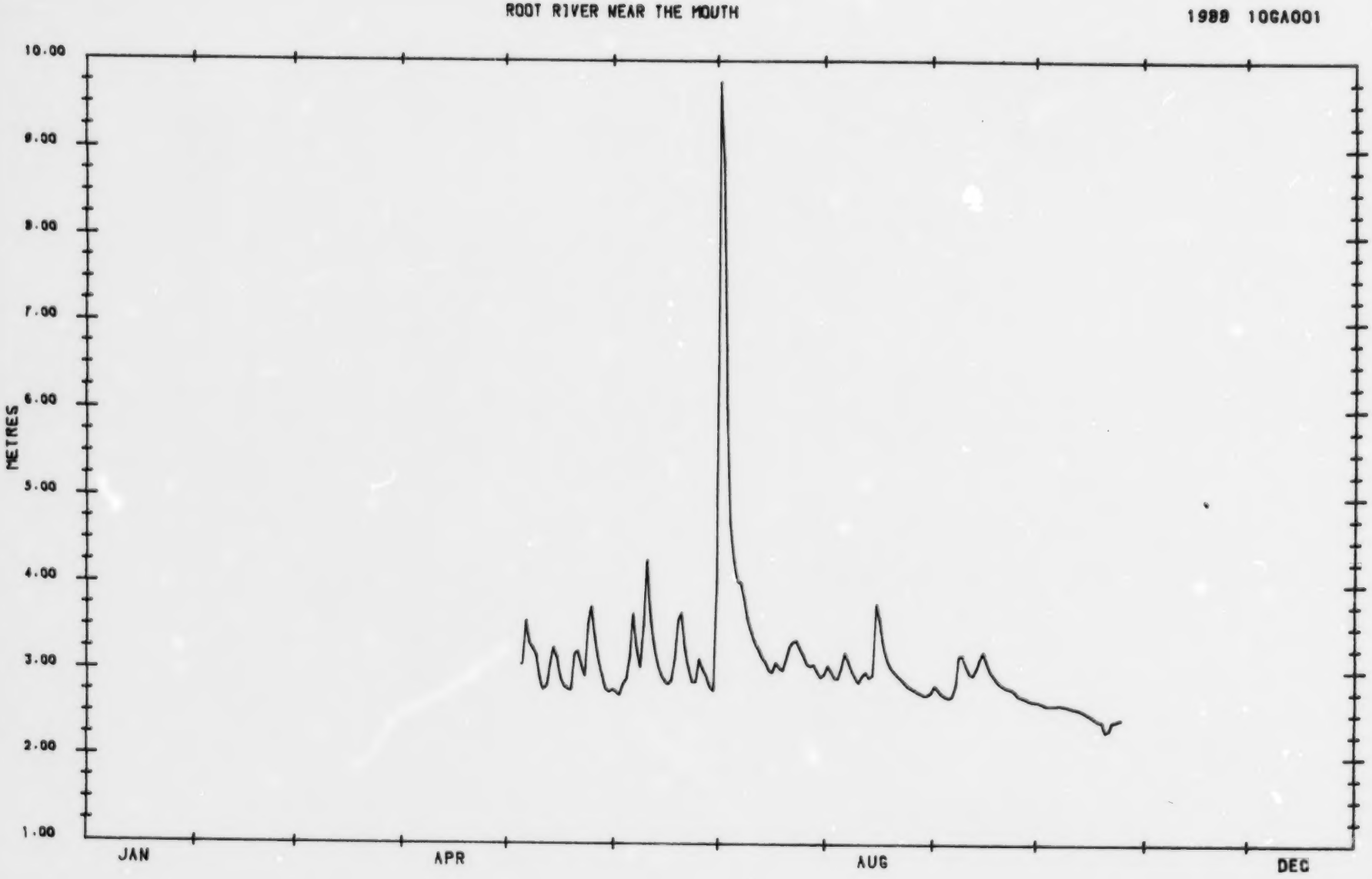

MACKENZIE RIVER NEAR FORT PROVIDENCE
1988 10FB001
METRES
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
JAN
APR
AUG
DEC

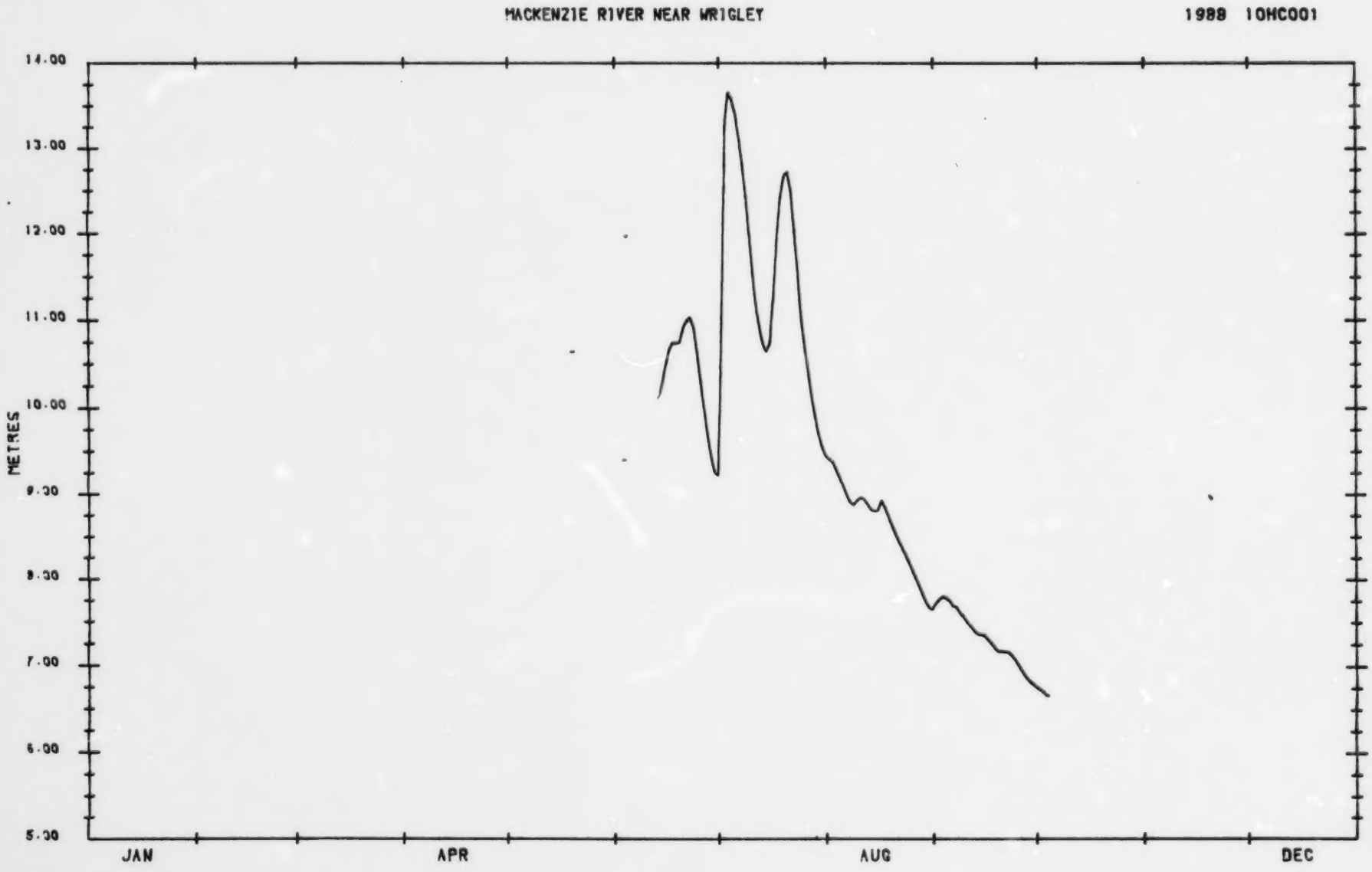

MACKENZIE RIVER AT FORT SIMPSON
1988 10GC001
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
METRES
JAN
APR
AUG
DEC

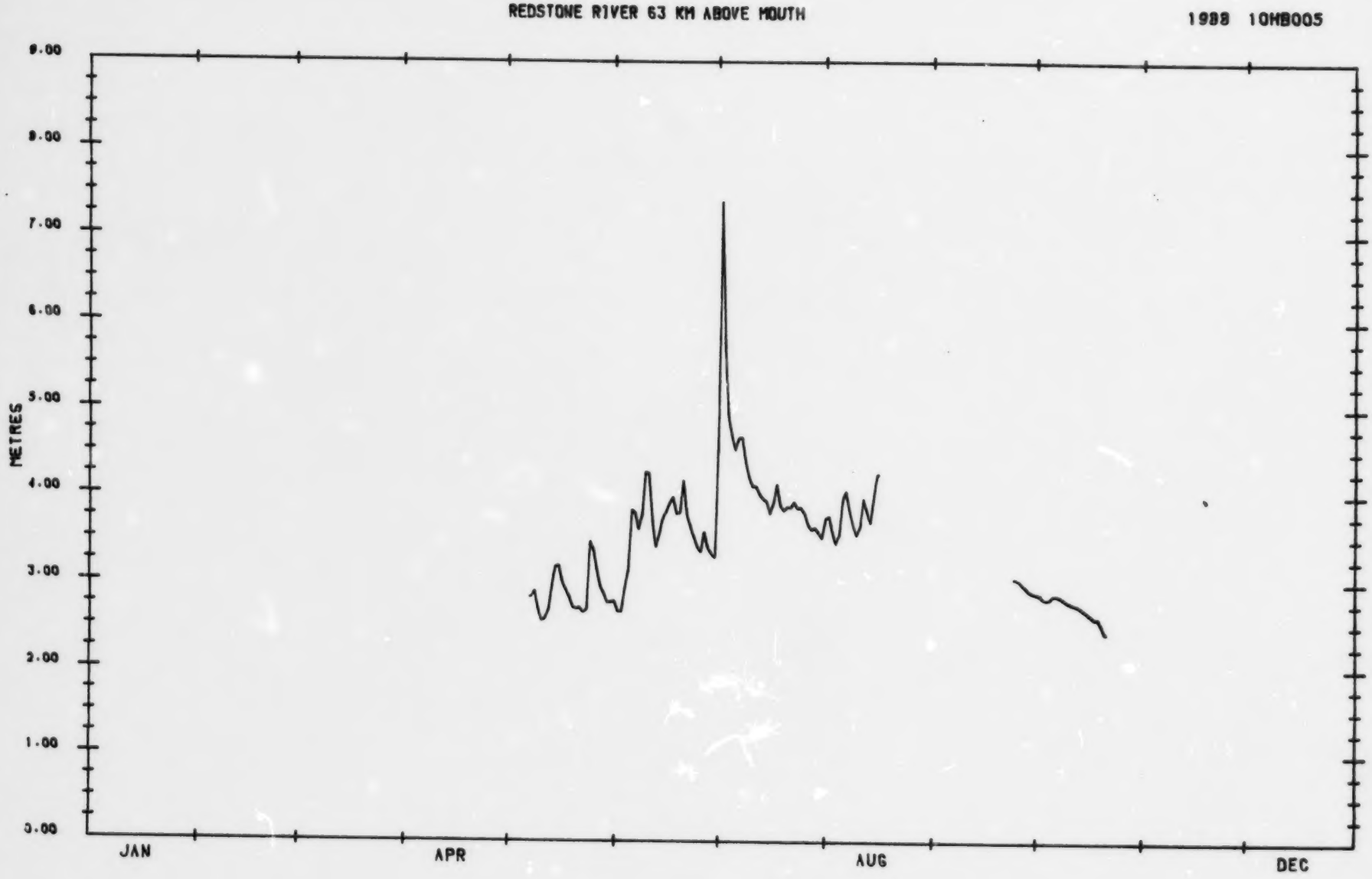

LIARD RIVER AT FORT LIARD
1988 10ED001
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
METRES
JAN
APR
AUG
DEC

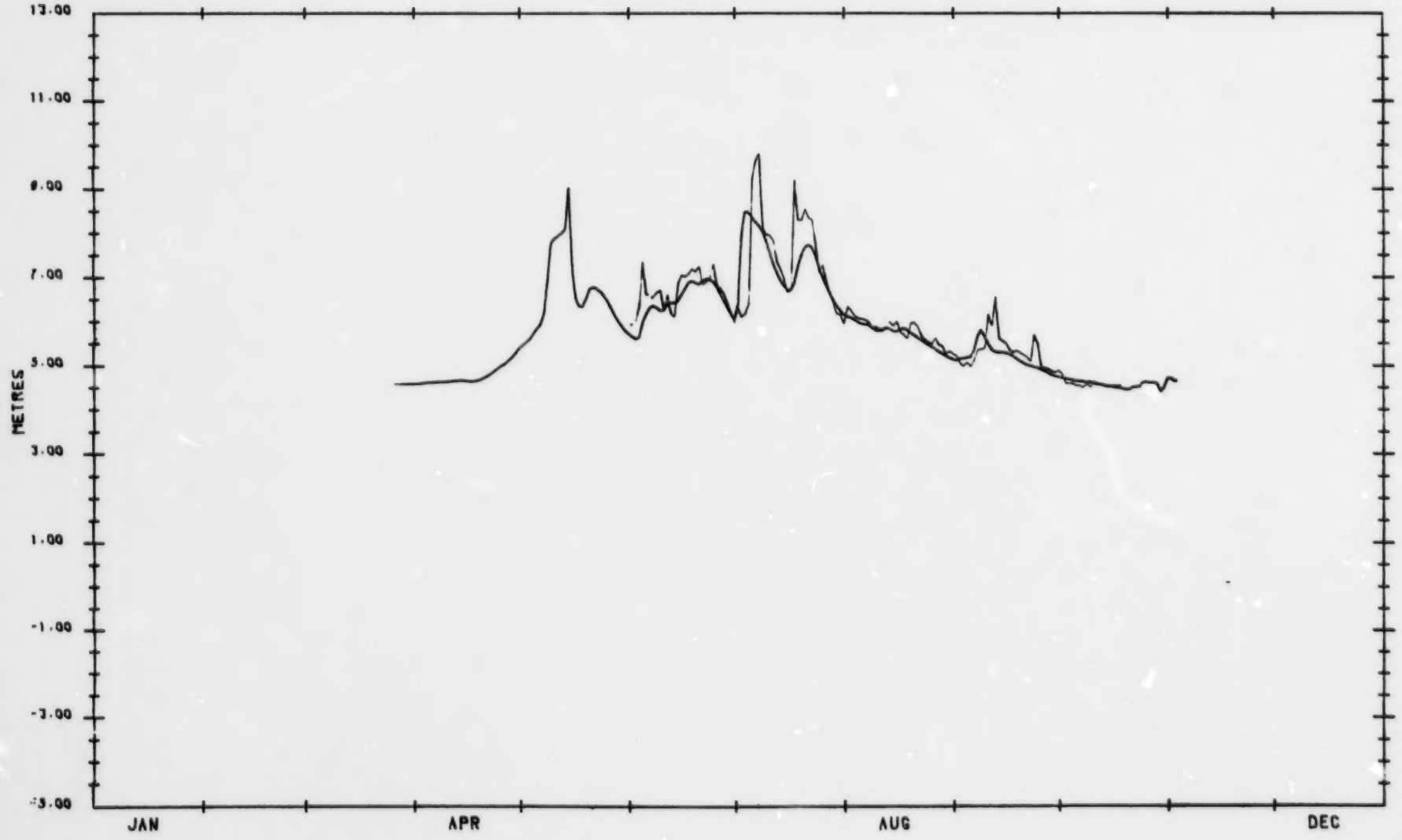

SOUTH NAHANNI RIVER ABOVE VIRGINIA FALLS
1988 10EB001
METRES
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
JAN
APR
AUG
DEC

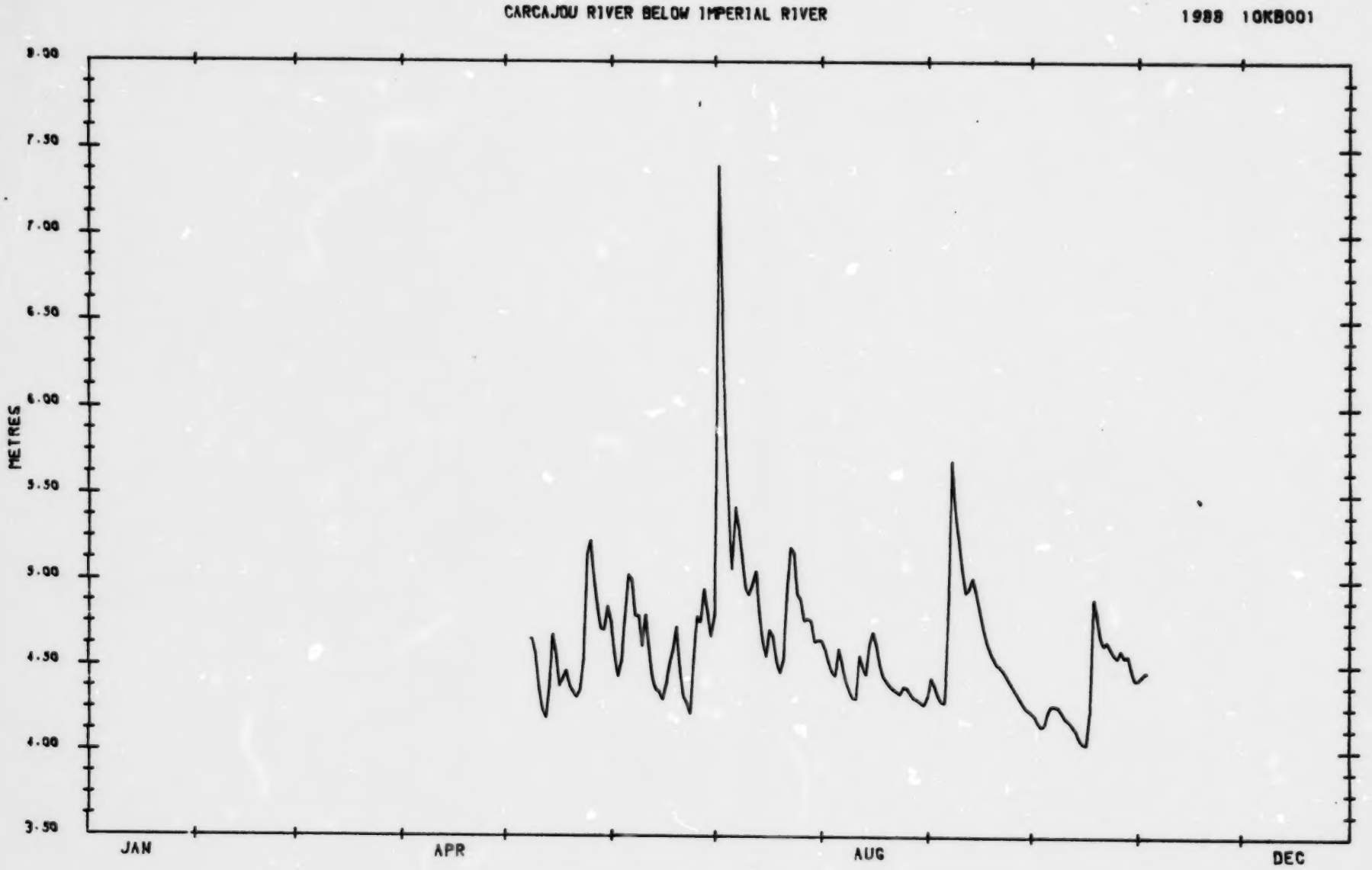

1988 10ED002
LIARD RIVER NEAR THE MOUTH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
METRES
JAN
APR
AUG
DEC

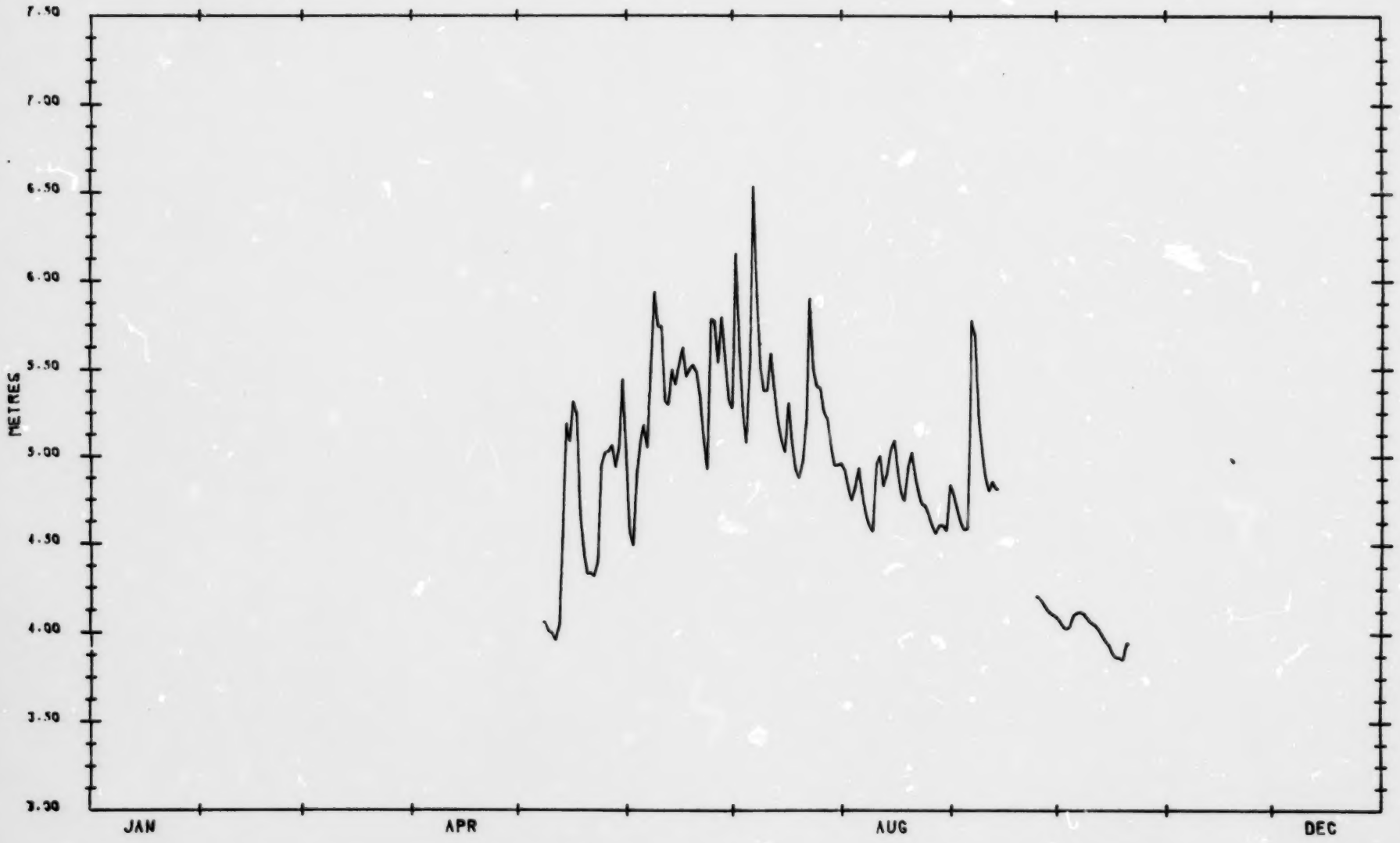

ROOT RIVER NEAR THE MOUTH
1988 10GA001
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
METRES
JAN
APR
AUG
DEC

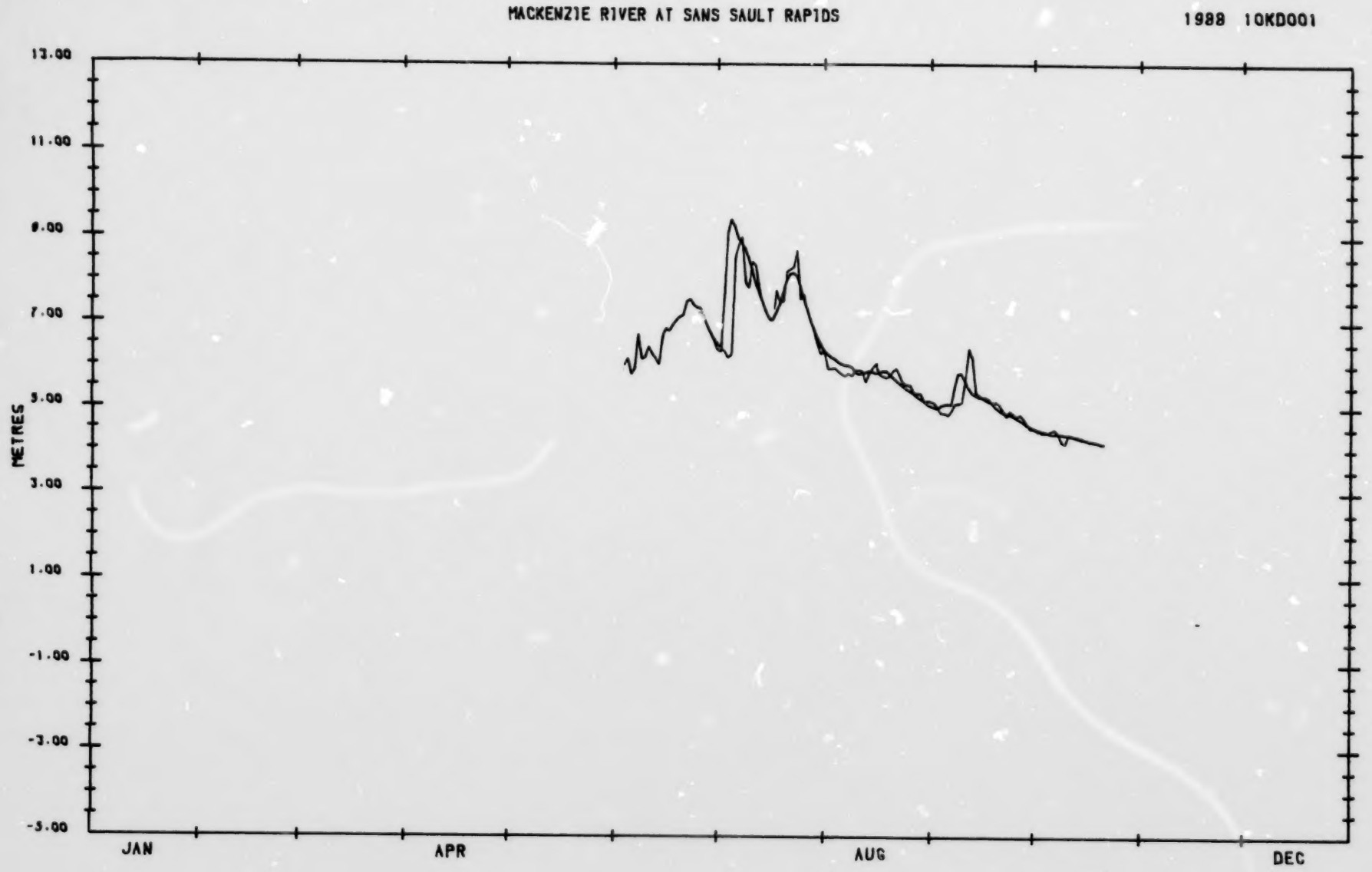

MACKENZIE RIVER NEAR WRIGLEY
1988 10HC001
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
METRES
JAN
APR
AUG
DEC

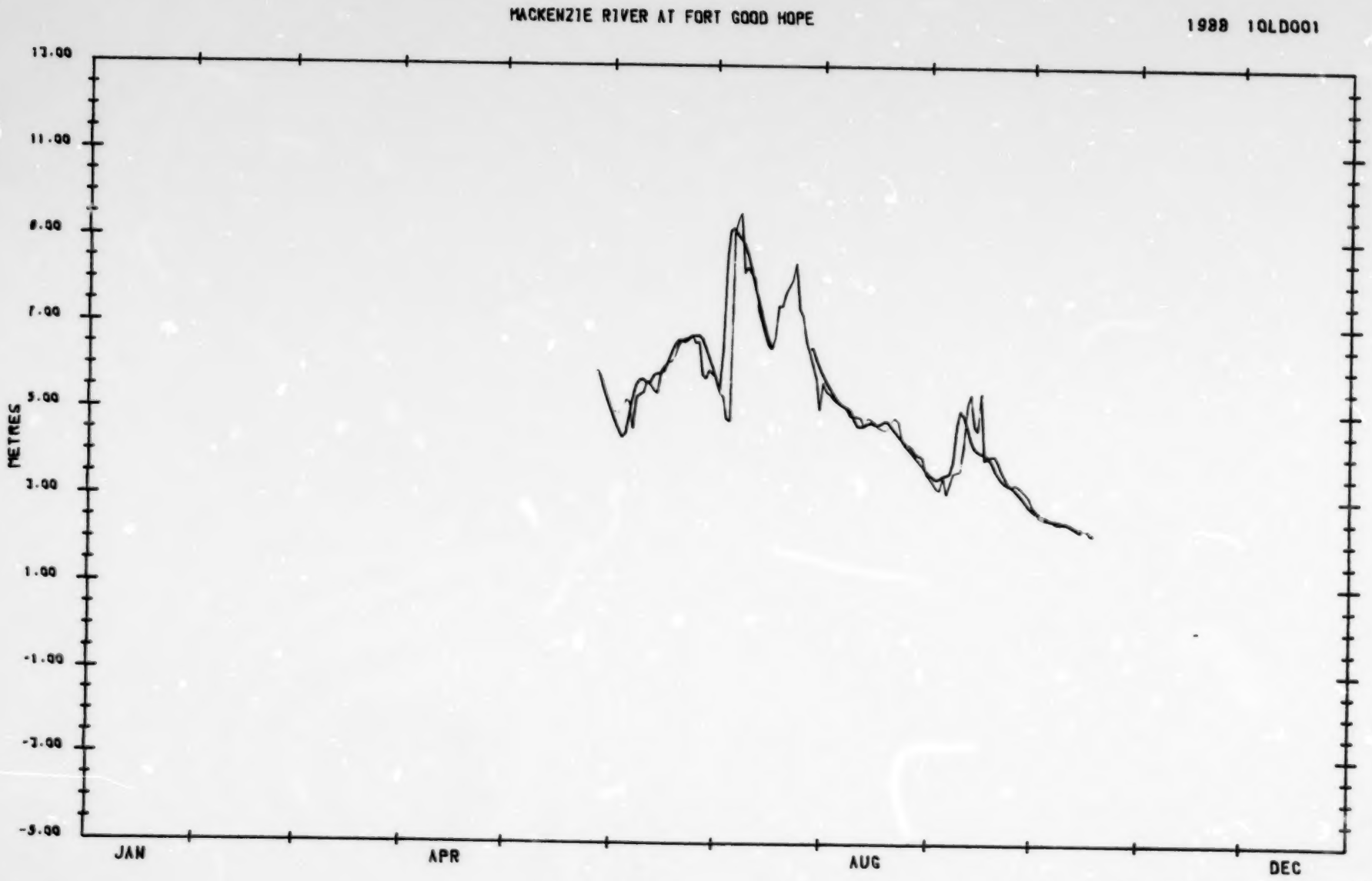

REDSTONE RIVER 63 KM ABOVE MOUTH
1988 10HB005
METRES
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
JAN
APR
AUG
DEC


MACKENZIE RIVER AT NORMAN WELLS
1988 10KA001
13.00
11.00
9.00
7.00
5.00
3.00
1.00
-1.00
-3.00
-5.00
METRES
JAN
APR
AUG
DEC


CARCAJOU RIVER BELOW IMPERIAL RIVER
1988 10KB001
METRES
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
JAN
APR
AUG
DEC


MOUNTAIN RIVER BELOW CAMBRIAN CREEK
1988 10KC001
METRES
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
JAN
APR
AUG
DEC


MACKENZIE RIVER AT SANS SAULT RAPIDS
1988 10KD001
13.00
11.00
9.00
7.00
5.00
3.00
1.00
-1.00
-3.00
-5.00
METRES
JAN
APR
AUG
DEC


MACKENZIE RIVER AT FORT GOOD HOPE
1988 10LD001
13.00
11.00
9.00
7.00
5.00
3.00
1.00
-1.00
-3.00
-5.00
METRES
JAN
APR
AUG
DEC